RESTRICTED CIRCULATION

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Evaporation from bare soil in April

L P Smith

The following assumptions were made:-

Potential evaporation is 25% higher than Potential Transpiration.
Water will evaporate from soil in the following manner.

(a) Light soils.

First 2 mms at full PE rate
Next 2 mms at $\frac{2}{3}$ PE
Next 2 mms at $\frac{1}{3}$ PE
Next 2 mms at 1/5 PE
Next 2 mms at 1/10 PE, thereafter at 1/20 PE.

(b) Heavy soils. As above with 4 mm in each layer.

Daily rainfall at Cranwell 1939-68 was used; the rainfall amounts being 'thrown forward' instead of the usual 'thrown back'. The 0900-0900 rain total was added to the soil moisture "bank", beginning at the top layer. The evaporation was then subtracted from the "bank", at a rate appropriate to the layer, beginning also from the top.

Due account was taken of the end of March weather in a similar manner. The (estimated) evaporation (E) was found to be dependent on three chief factors

R = total rainfall
PE = potential evaporation
D = number of dry days (less than 2 mms rainfall)

Then for light soils

$$\frac{E}{PE} = 0.94 + 0.18\,\frac{R}{PE} - 0.024D$$

for heavy soils

$$\frac{E}{PE} = 0.81 + 0.28\,\frac{R}{PE} - 0.166D$$

with average errors of about 3mm and multiple corrclations of 0.92 and 0.90.

Any comments or suggestions on this paper should be referred to the author.

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